How to think of sustainability when planning and building new ventures?

Bioinnovation Day 2023

Sascha NICK

How to think of sustainability - key points

The Big Picture of sustainability: Goals - Politics - Frameworks

Company sustainability: Counterfactual - Get it right - Financing

Examples: Circularity - Genuine climate action - New devices

Contribution of Life Sciences: nutrition, health, ecosystems

EPFL Sascha NICK LEURE

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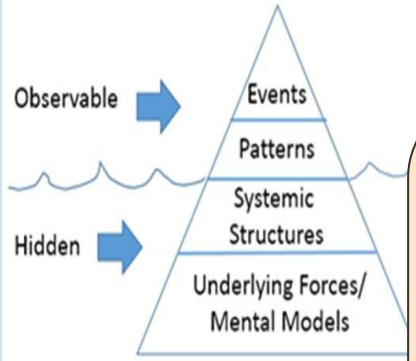
Understanding:

- Complex systems
- The World

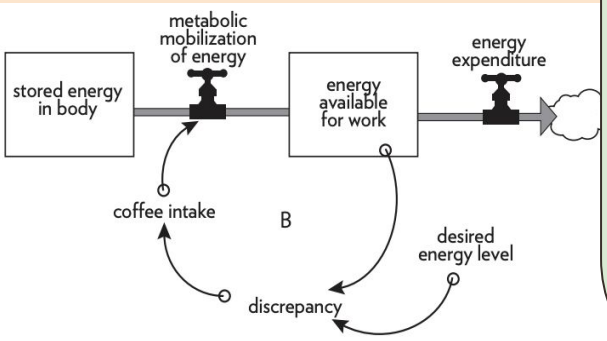
Emergence

Iceberg model



Monat et al 2020

Stocks and flows



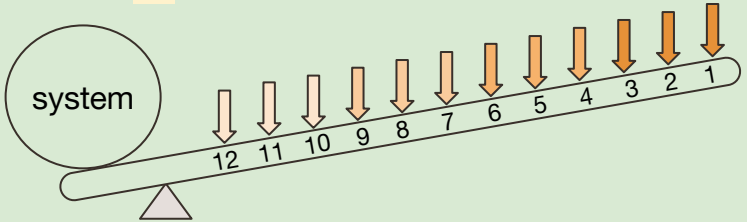
Meadows 2008

Leverage points

high

Intent	1. The power to transcend paradigms 2. Mindset, worldview, values 3. System goals
Design	4. Power to change system structure 5. System rules 6. Structure of information flow
Feed-back	7. Gain of positive feedback loops 8. Strength of negative feedback loops 9. Delays
Para-meters	10. Structure of stocks and flows 11. Buffer size 12. Parameters, incentives, standards

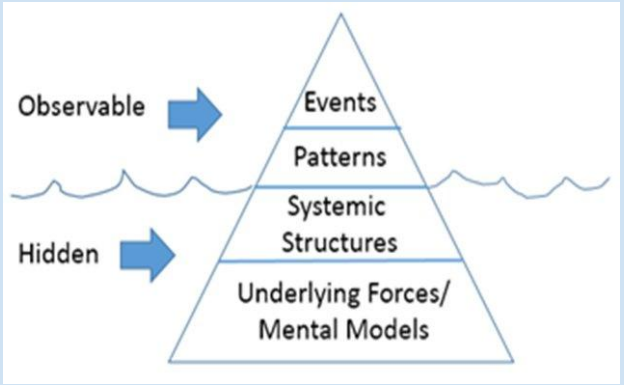
low



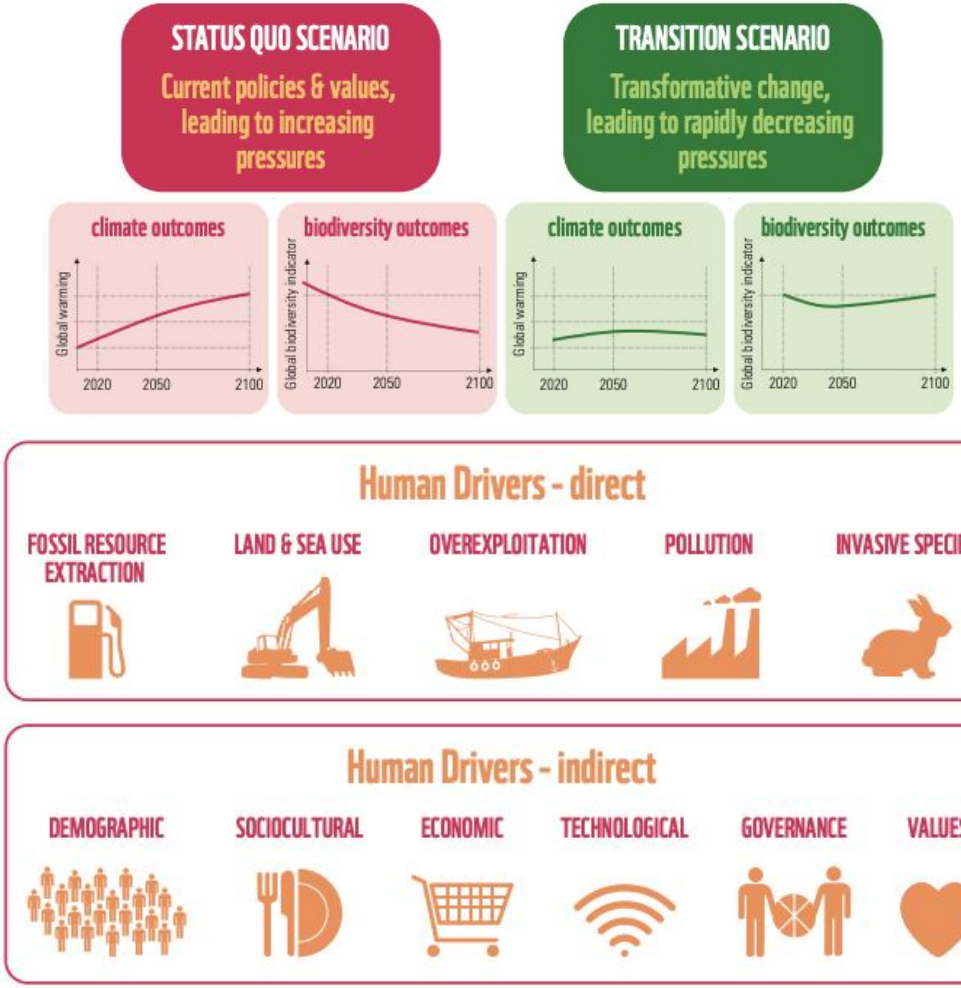
Adapted from Abson et al 2016 and Meadows 1999

Example: biodiversity loss, iceberg model

Iceberg model

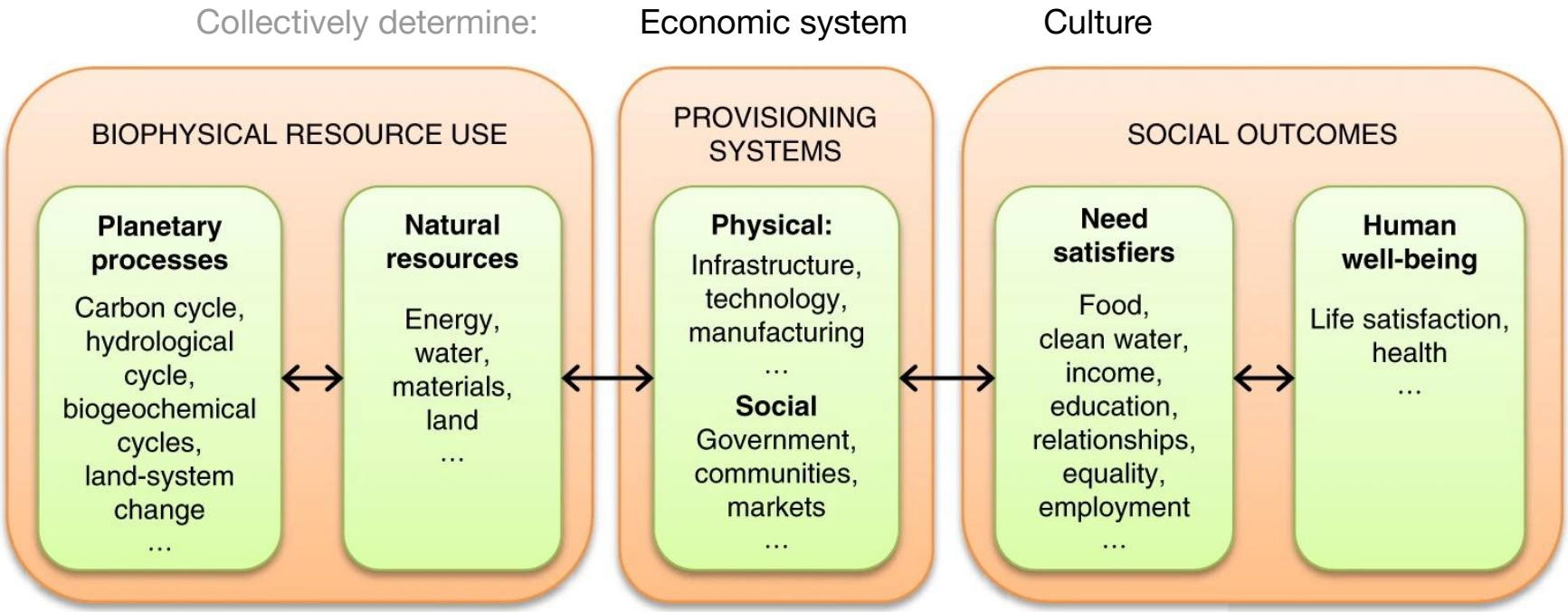


Monat et al 2020



Adapted from WWF Living Planet Report 2022

What is the Goal of Society?



Analytical framework from Living Well Within Limits (LiLi), O'Neill et al 2018

Deliberative democracy

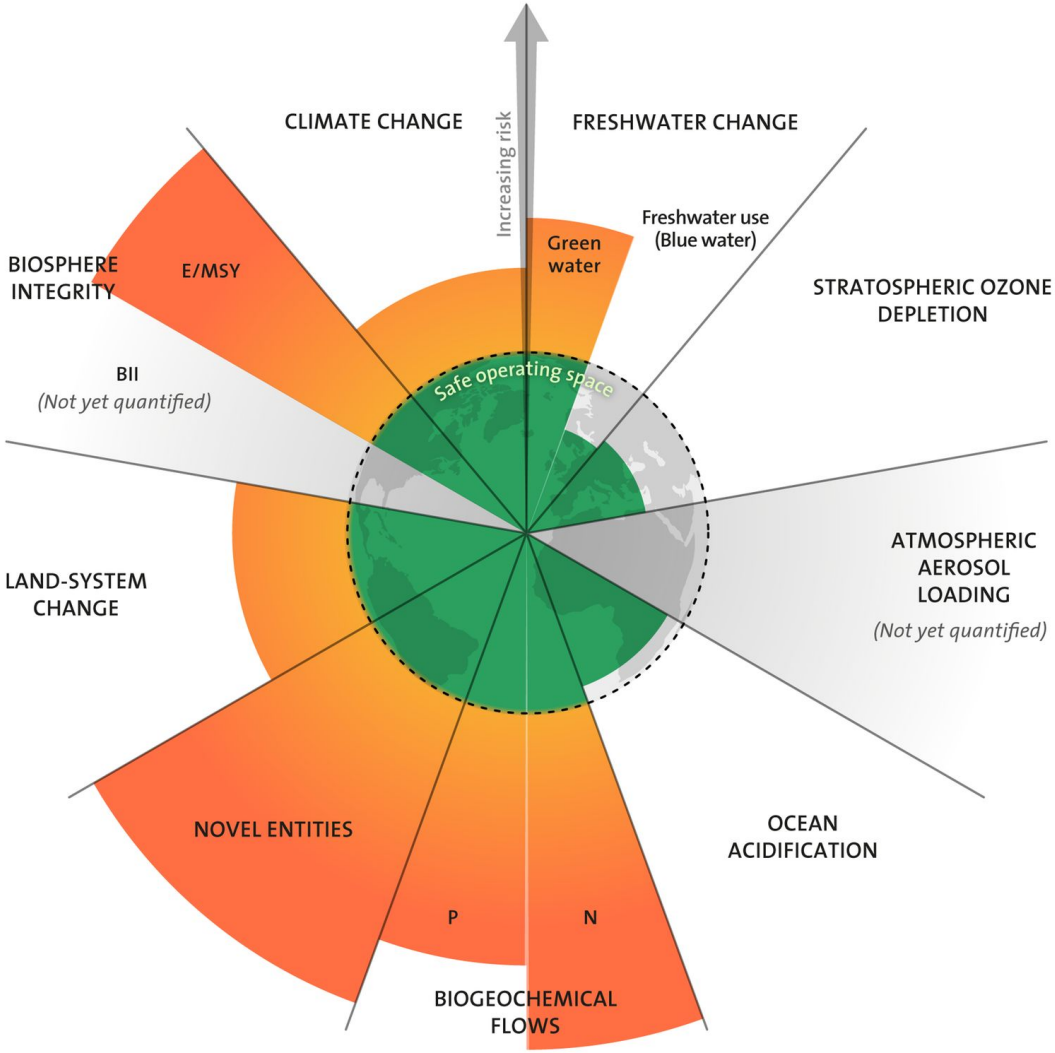
In Max Weber's disenchantment of the world (Entzauberung der Welt) of modernity, the increasingly rationalized scientific, artistic, and legal spheres detached themselves from religious tradition, following their separate inner logics, creating tension in the process – leading to both loss of meaning and loss of liberty (Vitale 2006).

Habermas disagreed, seeing the gap between elites (scientists, artists, jurists) and everyday life as responsible. There is no natural equilibrium between the three spheres, and today the **capitalist system and the modern state are overdeveloped, at the expense of the lifeworld** (Lebenswelt) - the lived (erlebt) world, as understood or experienced together.

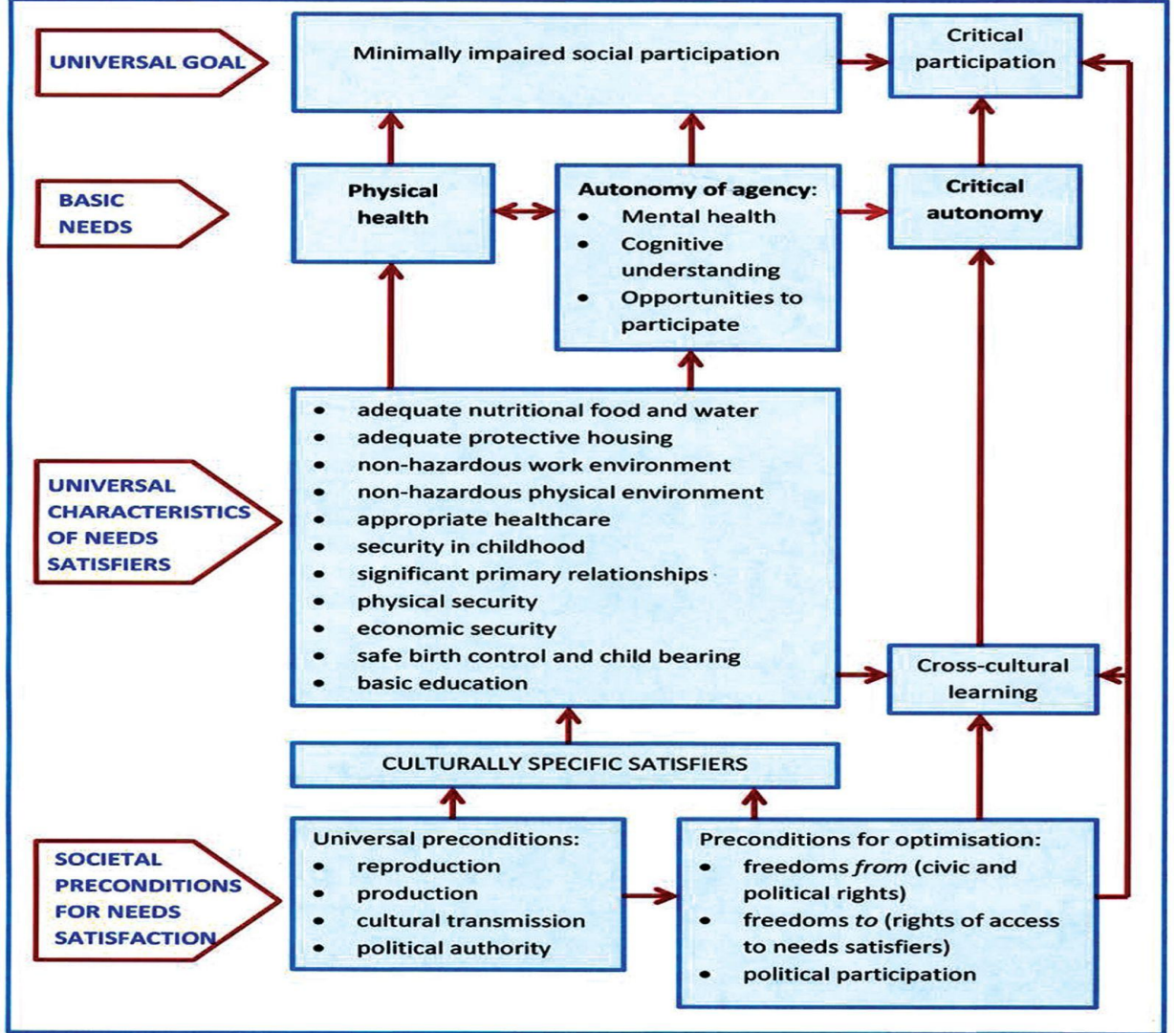
According to Habermas, the solution is to strengthen the lifeworld through communication, and only democracy can ensure mutual understanding leading to consensus, as well as check the expansion of capitalism and state.

Furthermore, **deliberative democracy replaces competition between interests of the market paradigm with dialogue, leading to opinion- and will-formation**.

Planetary boundaries



Wellbeing as satisfaction of human needs



Outline of the theory of human need, reproduced from Doyal & Gough 1991

Max-Neef's matrix of needs and satisfiers

		Existential needs			
		Being	**Having**	**Doing**	**Interacting**
Axiological needs	**Subsistence**	physical health, mental health, equilibrium, sense of humour, adaptability	food, shelter, work	feed, procreate, rest, work	living environment, social setting
	Protection	care, adaptability, autonomy, equilibrium, solidarity	insurance systems, savings, social security, health systems, rights, family, work	cooperate, prevent, plan, take care of, cure, help	living space, social environment, dwelling
	Affection	self-esteem, solidarity, respect, tolerance, generosity, receptiveness, passion, determination, sensuality, sense of humour	friendships, family, partnerships, pets, relationships with nature	make love, caress, express emotions, share, take care of, cultivate, appreciate	privacy, intimacy, home, space of togetherness
	Understanding	critical conscience, receptiveness, curiosity, astonishment, discipline, intuition, rationality	literature, teachers, method, educational policies, communication policies	investigate, study, experiment, educate, analyze, meditate	settings of formative interaction, schools, universities, academies, groups, communities, family
	Participation	adaptability, receptiveness, solidarity, willingness, determination, dedication, respect, passion, sense of humour	rights, responsibilities, duties, privileges, work	become affiliated, cooperate, propose, share, dissent, obey, interact, agree on, express opinions	settings of participative interaction, parties, associations, churches, communities, neighbourhoods, family
	Idleness	curiosity, receptiveness, imagination, recklessness, sense of humour, tranquility, sensuality	games, spectacles, clubs, parties, peace of mind	daydream, brood, dream, recall old times, give way to fantasies, remember, relax, have fun, play	privacy, intimacy, spaces of closeness, free time, surroundings, landscapes
	Creation	passion, determination, intuition, imagination, boldness, rationality, autonomy, inventiveness, curiosity	abilities, skills, method, work	work, invent, build, design, compose, interpret	productive and feedback settings, workshops, cultural groups, audiences, spaces for expression, temporal freedom
	Identity	sense of belonging, consistency, differentiation, self-esteem, assertiveness	symbols, language, religion, habits, customs, reference groups, sexuality, values, norms, historical memory, work	commit oneself, integrate oneself, confront, decide on, get to know oneself, recognize oneself, actualize oneself, grow	social rhythms, everyday settings, settings which one belongs to, maturation stages
	Freedom	autonomy, self-esteem, determination, passion, assertiveness, open-mindedness, boldness, rebelliousness, tolerance	equal rights	dissent, choose, be different from, run risks, develop awareness, commit oneself, disobey	temporal/spatial plasticity

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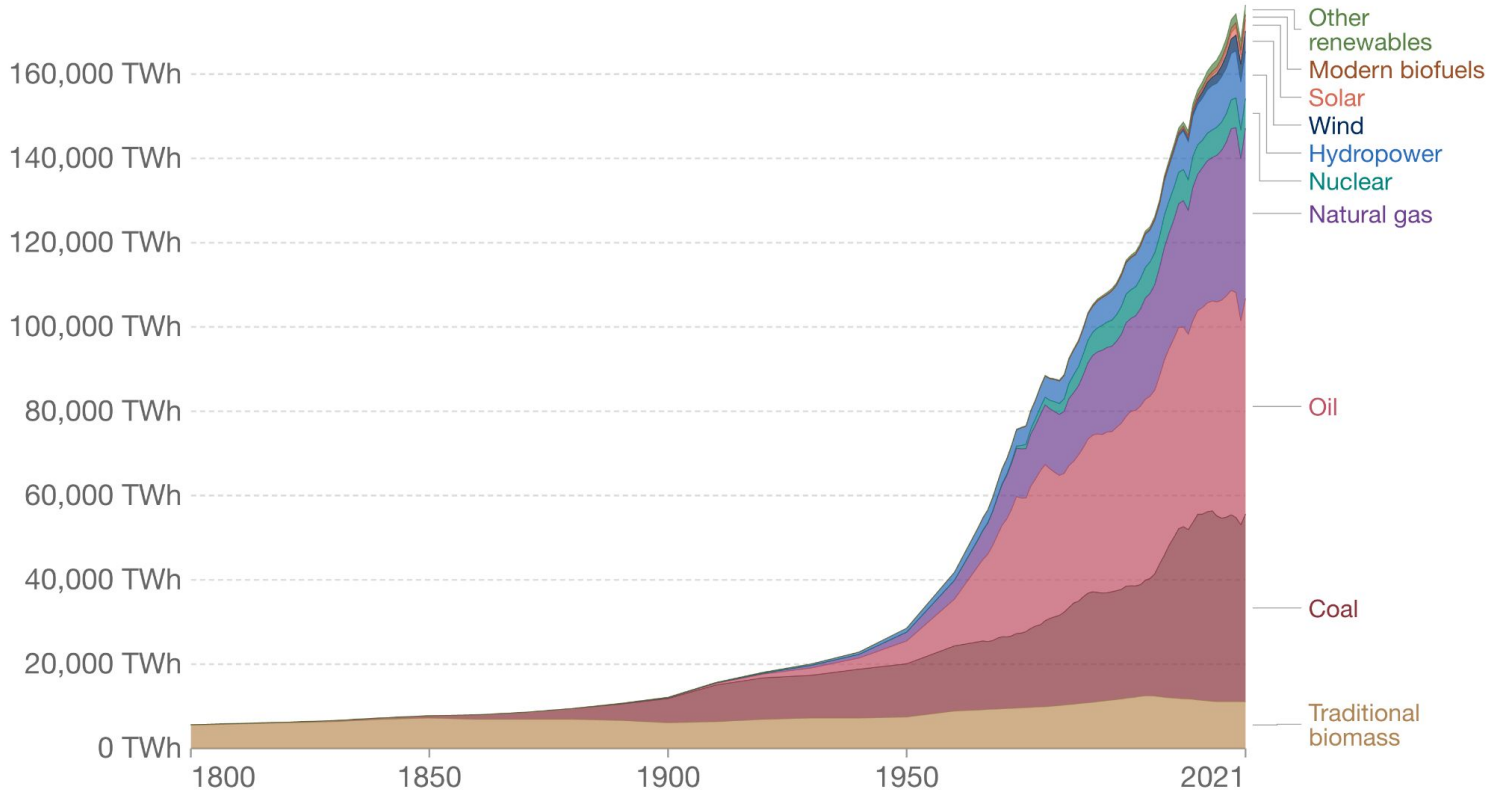
Global primary energy consumption by source

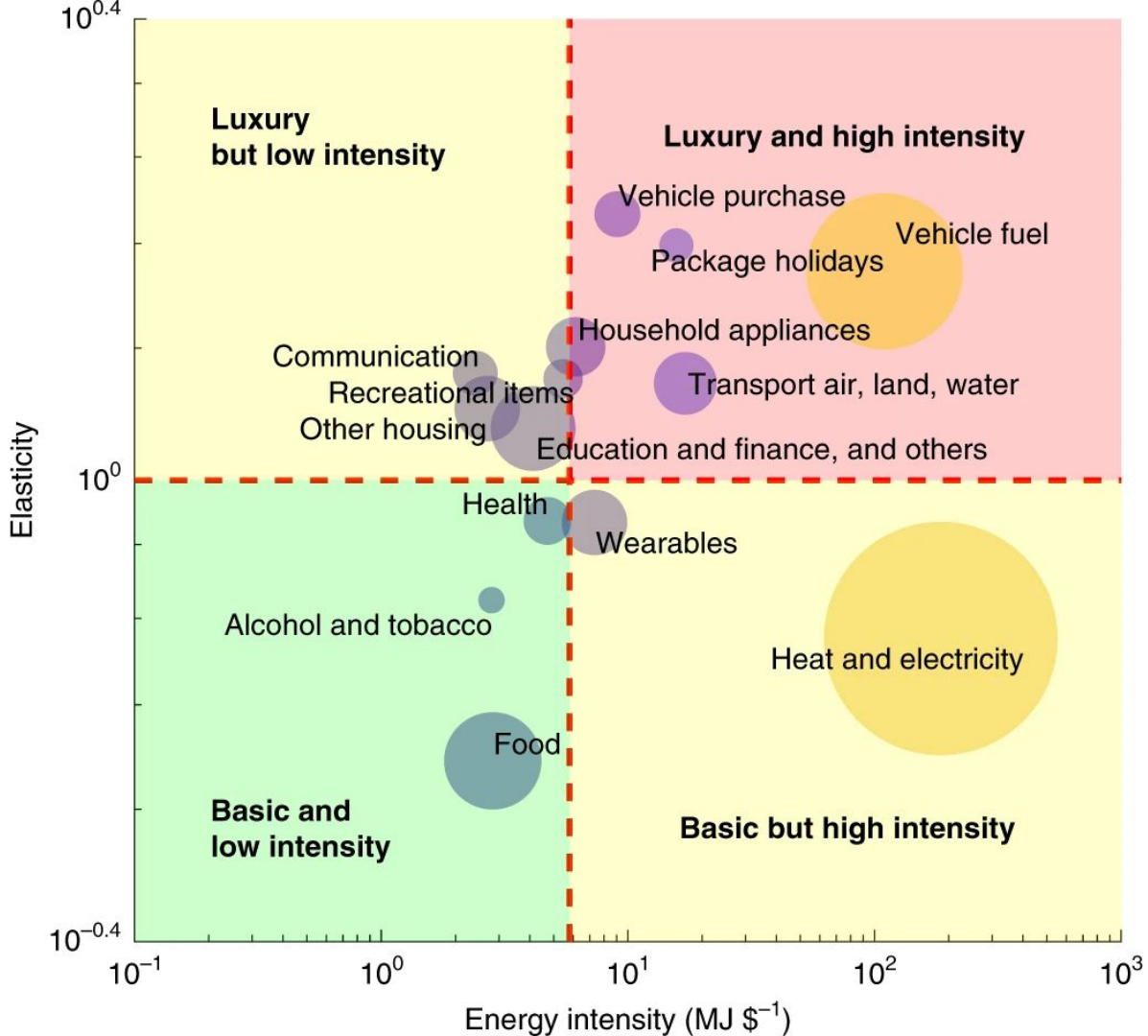
Primary energy is calculated based on the 'substitution method' which takes account of the inefficiencies in fossil fuel production by converting non-fossil energy into the energy inputs required if they had the same conversion losses as fossil fuels.

Our World in Data



Source: Our World in Data based on Vaclav Smil (2017) and BP Statistical Review of World Energy

OurWorldInData.org/energy • CC BY



Oswald et al 2020:

Large inequality in international and intranational energy footprints between income groups and across consumption categories

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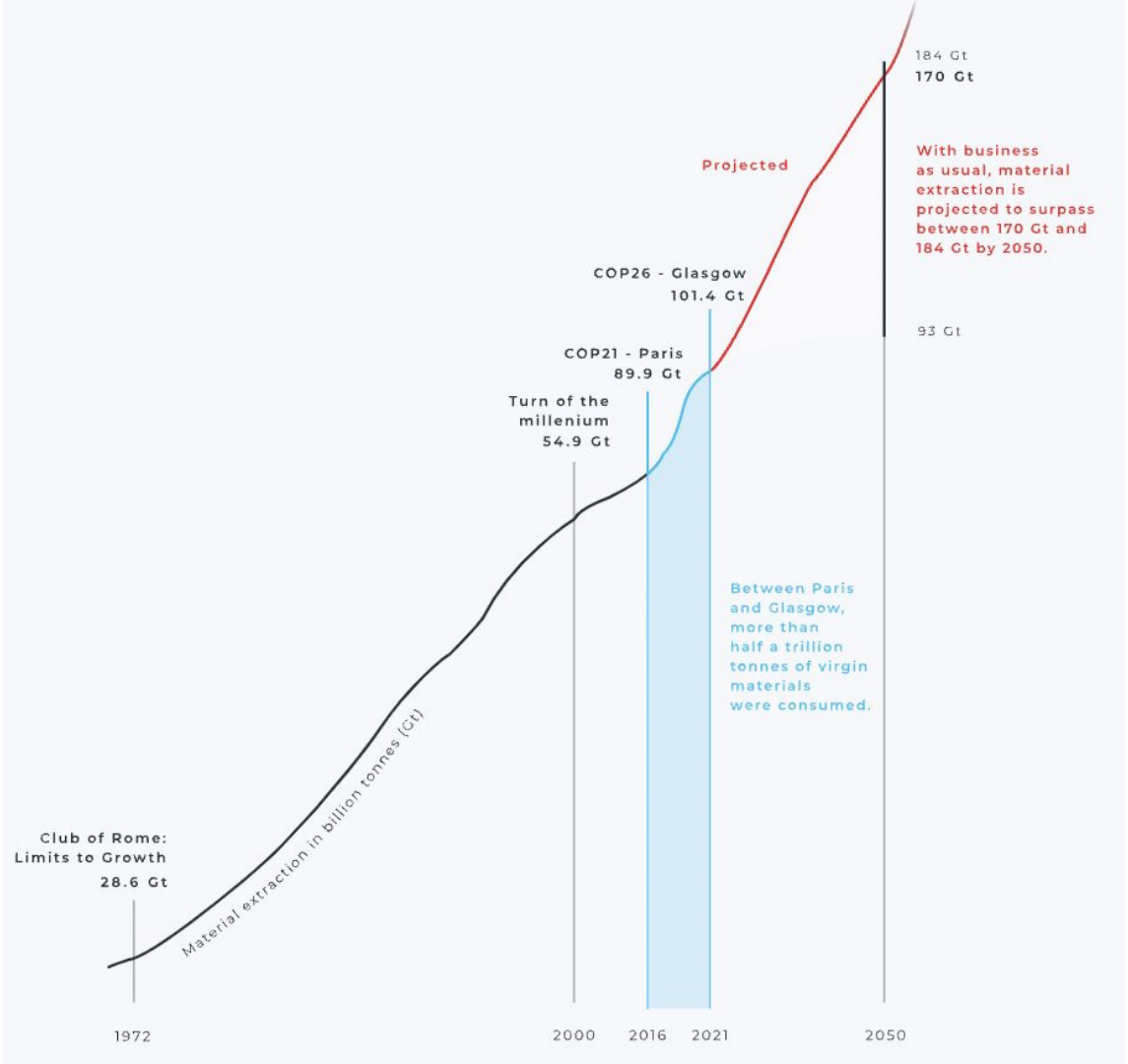
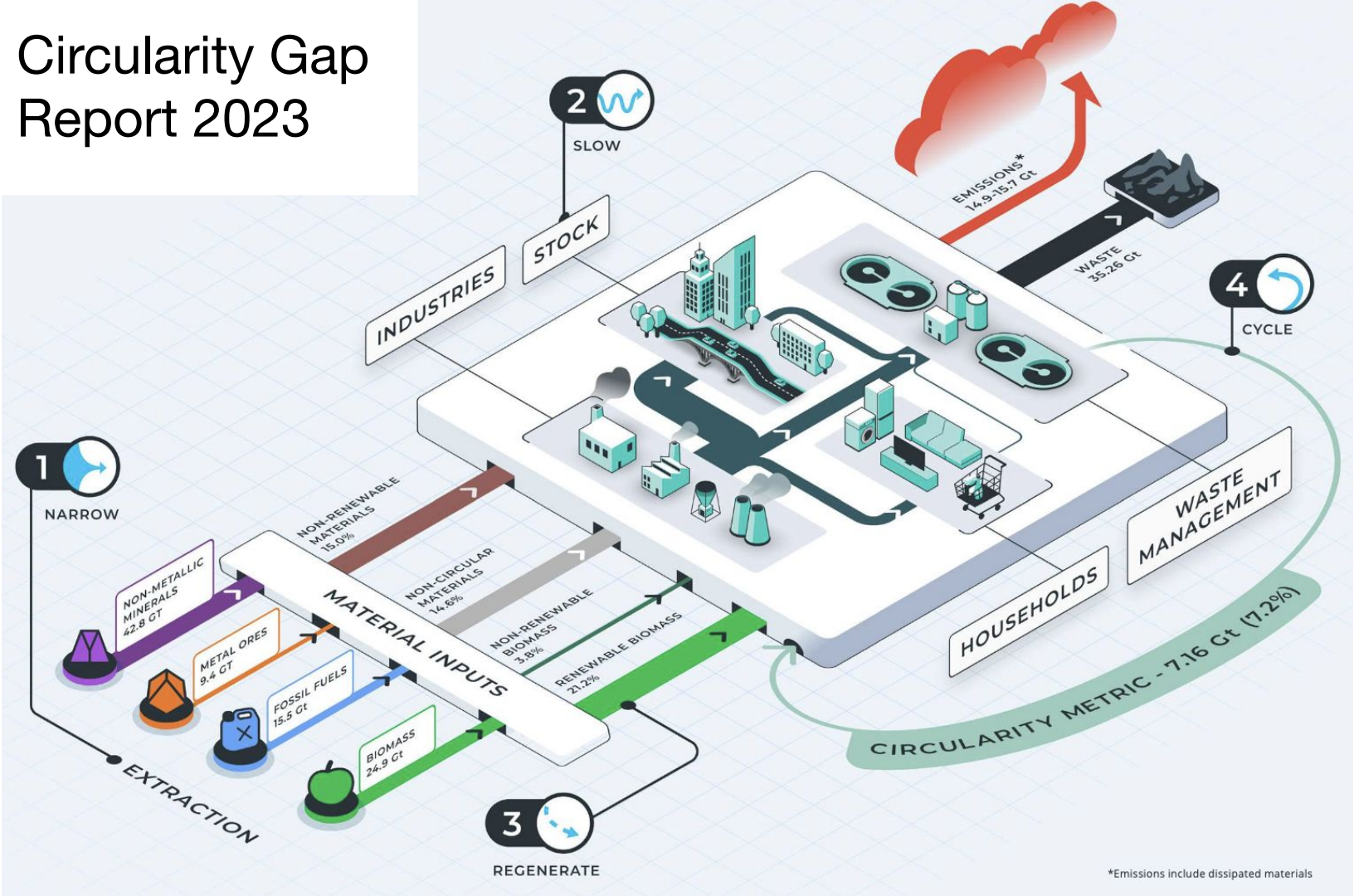

184 Gt
170 Gt
Projected
With business as usual, material extraction is projected to surpass between 170 Gt and 184 Gt by 2050.
COP26 - Glasgow
101.4 Gt
93 Gt
COP21 - Paris
89.9 Gt
Turn of the millenium
54.9 Gt
Between Paris and Glasgow, more than half a trillion tonnes of virgin materials were consumed.
Material extraction in billion tonnes (Gt)
Club of Rome: Limits to Growth
28.6 Gt
1972
2000
2016
2021
2050

Circularity Gap Report 2023



Typology of Climate Action

1 Sufficiency | 2 Efficiency | 3 Clean Energy | 4 CCS | 5 NET | 6 SRM | 7 Adaptation

Stabilize temperature

Stabilize CO_2 concentration

Reduce emissions

Adapt to changed climate

Mitigation (IPCC): reduce sources or enhance sinks

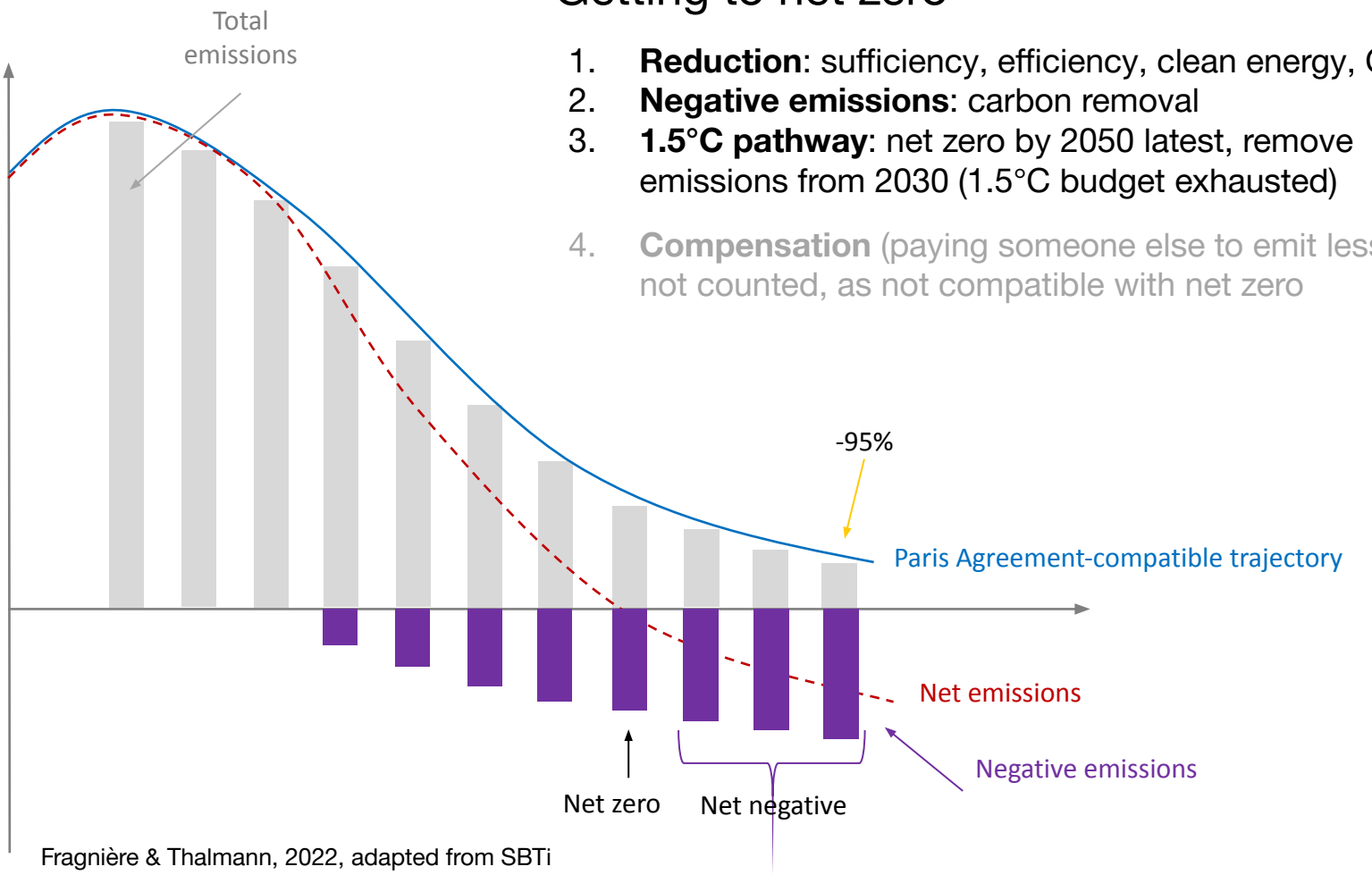
Adaptation: reduce harm

CCS: carbon capture and storage; NET: negative emissions (technologies); SRM: solar radiation management

Getting to net zero

1. **Reduction**: sufficiency, efficiency, clean energy, CCS
2. **Negative emissions**: carbon removal
3. **1.5°C pathway**: net zero by 2050 latest, remove emissions from 2030 (1.5°C budget exhausted)

4. **Compensation** (paying someone else to emit less): not counted, as not compatible with net zero



Fragnière & Thalmann, 2022, adapted from SBTi

Voluntary carbon credits: real or fake?

Based on a new analysis at least 90% of Verra's rainforest carbon credits do not represent real emission reductions

Each credit is equal to one metric tonne of CO2 equivalent

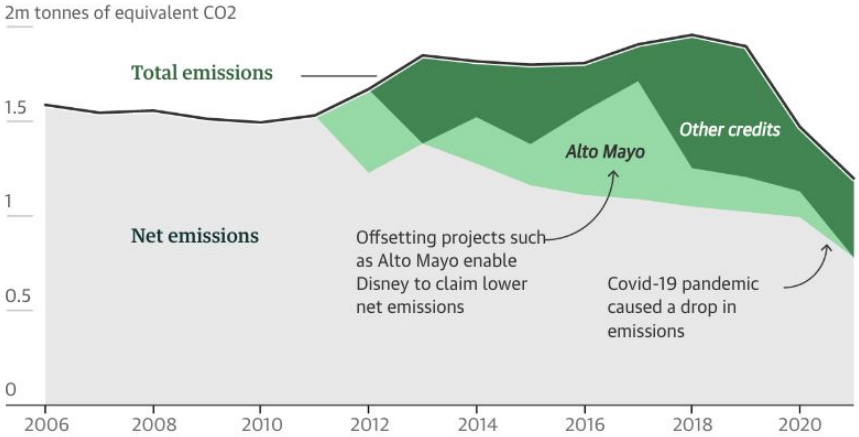
94.9m carbon credits claimed

5.5m real emissions reductions

Guardian graphic. Source: The Guardian analysis based on a significant percentage of the projects as looked by West et al studies and Verra registry (accessed in August 2022). All figures are estimates. West et al 2023 is a pre-print. Note: Verra's claims versus analysis of independent scientific studies

Disney's net zero claim is highly reliant on one project in the Peruvian Amazon

Annual figures for total and net emissions claims from Disney



Guardian graphic. Source: Guardian research. The Guardian has applied the findings of the West et al 2023 study to Disney's self-reported net zero claim. Unable to access figures for Alto Mayo project in 2013 and 2021

Table S1: Overview of corporate climate responsibility good practice assessment for 24 companies in 2023

1 TRACKING AND DISCLOSING EMISSIONS	GOOD PRACTICE	TRANSPARENCY & INTEGRITY
Comprehensiveness of disclosure	✓ Disclose full details on their GHG emissions on an annual basis, with a breakdown of the data to specific emission sources (including scope 1, 2, 3 and non-GHG climate forcers) and the presentation of historical data for each emission source.	Moderate ▲

2 SETTING SPECIFIC AND SUBSTANTIATED TARGETS	GOOD PRACTICE	AVERAGE PERFORMANCE* & CHANGE SINCE 2022	
		TRANSPARENCY*	INTEGRITY*
Short- & medium-term targets towards 2030	✓ Set short- and medium-term emission reduction targets *towards* 2030 within five-year intervals that reflect a commitment to immediate action and accountability. Targets should be independent from offsetting and aligned with 1.5°C-compatible trajectories in the sector, across all emission scopes.	Moderate ▲	Very low —
Long-term targets beyond 2030	✓ Set specific long-term emission reduction targets *beyond 2030* that are independent from offsetting and aligned with 1.5°C-compatible trajectories in the sector, across all emission scopes, as a *vision* for deep decarbonisation.	Low —	Very low —

3 REDUCING EMISSIONS	GOOD PRACTICE	AVERAGE PERFORMANCE* & CHANGE SINCE 2022	
		TRANSPARENCY*	INTEGRITY*
Emission reduction measures	✓ Implement encompassing and deep decarbonisation measures and disclose details of those measures to support replication. ✓ Refrain from using bioenergy where alternatives to combustion exist, and ensure that any bioenergy they use does not have negative sustainability implications.	Moderate ▲	Low —
Renewable energy procurement	✓ Procure the highest quality renewable electricity available and disclose the details of that procurement.	Low —	Very low —

4 CLIMATE CONTRIBUTIONS AND OFFSETTING	GOOD PRACTICE	AVERAGE PERFORMANCE* & CHANGE SINCE 2022	
		TRANSPARENCY*	INTEGRITY*
Responsibility for unabated emissions	✓ Pursue high transparency and integrity on climate contributions and any neutralisation claims made today (see criteria below).	Low —	Very low —
Climate contributions	✓ Provide an ambitious volume of financial support to climate change mitigation activities beyond the value chain, without claiming to neutralise the company's own emissions.	Low ▲	Very low —
Offsetting claims today	Clearly disclose offsetting claims and plans; avoid misleading pledges and claims; avoid risk of distraction by also committing to measures for deep emission reductions; commit to procure only high-quality credits from ambitious projects with a permanent climate impact; and commit to preventing any form of double-counting of climate impacts.	Low —	Very low —
Offsetting plans for the future	✓	Low —	Very low —

* Transparency and integrity columns: the bar indicates the distribution of our rating of the 24 companies (Poor Moderate High n/a); the text above the shaded bars represents the average rating across all the companies we assessed, calculated excluding non-applicable cases, on a 5-point scale (Very low, Low, Moderate, Reasonable, High); and an indication of progress since the last analysis in 2022 (▲ — ▼), based on the authors' interpretation of progress from the companies that were analysed also in 2022, against the current methodology version. Good practices were derived from the principles elaborated in the following subsections, and from a compilation of the practices identified from existing company strategies. Full details on the assessment methodology can be found in the accompanying methodology document, *Guidance and assessment criteria for good practice corporate emission reduction and net-zero targets: Version 3.0* (NewClimate Institute, 2023b).

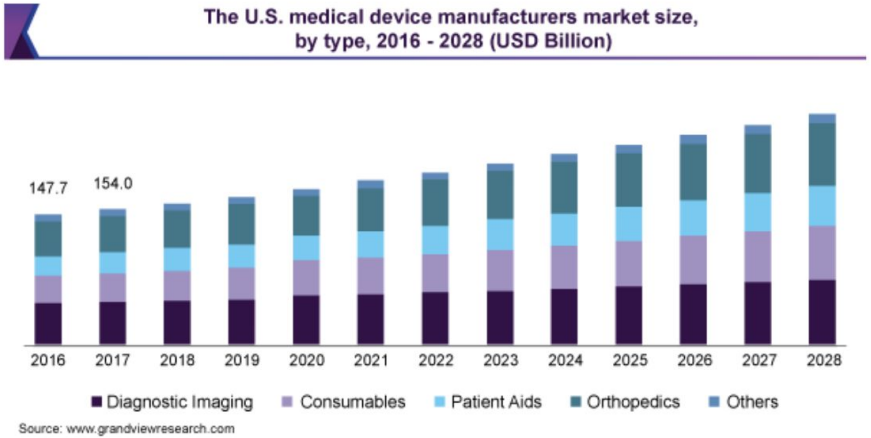
Table S2: Overview of companies assessed in the Corporate Climate Responsibility Monitor 2023

HIGH INTEGRITY	HEADLINE PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
No companies achieved a high integrity rating				
REASONABLE INTEGRITY	**HEADLINE PLEDGE**	**TRANSPARENCY**	**INTEGRITY**	**PAGE**
Maersk	Net zero by 2040			p. 100
MODERATE INTEGRITY	**HEADLINE PLEDGE**	**TRANSPARENCY**	**INTEGRITY**	**PAGE**
Apple	Carbon neutral by 2030			p. 78
Arcelor Mittal	Net zero by 2050			p. 80
Google	Net zero by 2030			p. 90
H&M Group	Net zero by 2040			p. 92
Holcim	Net zero by 2050			p. 94
Microsoft	Carbon negative by 2030			p. 104
Stellantis	Net-zero carbon by 2038			p. 112
Thyssenkrupp	Climate neutral by 2050			p. 114
LOW INTEGRITY	**HEADLINE PLEDGE**	**TRANSPARENCY**	**INTEGRITY**	**PAGE**
Ahold Delhaize	Net zero by 2050			p. 72
Amazon	Net-zero carbon by 2040			p. 74
Deutsche Post DHL	Net zero by 2050			p. 84
Fast Retailing	2030 emission reduction targets			p. 86
Foxconn	Net zero by 2050			p. 88
Inditex	Net zero by 2040			p. 96
Mercedes-Benz	Carbon neutral vehicles by 2039			p. 102
Nestlé	Net zero by 2050			p. 106
PepsiCo	Net zero by 2040			p. 108
Volkswagen	Carbon neutral by 2050			p. 116
Walmart	Zero emissions by 2040			p. 118
VERY LOW INTEGRITY	**HEADLINE PLEDGE**	**TRANSPARENCY**	**INTEGRITY**	**PAGE**
American Airlines	Net zero by 2050			p. 76
Carrefour	Carbon neutral by 2040			p. 82
JBS	Net zero by 2040			p. 98
Samsung Electronics	Net-zero carbon by 2050			p. 110

RATINGS **5-point scale** High Reasonable Moderate Low Very low **. See individual company analyses.**
Assessments were made based on public information identified by the authors. A poor rating may not necessarily be an indication that a company's climate strategy is weak, but could also indicate that the information was insufficient to confirm good practice. Ambitious companies can improve their ratings by ensuring that all aspects of their climate responsibility strategies are transparently and accurately disclosed, and in the public domain.

Medical device e-waste

Is this practice sufficient? →



Best Practice Checklist

Feeling Inspired But Not Sure Where or How to Start?

Based on our experience working with leading healthcare organizations across the country, we've pulled together a few best practice tips to help you identify and advance opportunities to reduce waste and enable more environmentally conscious management of information across your organization.

1 **Identify information and assets being managed across the organization that result in some form of waste being generated.**
Identify how that waste is being managed, and think bigger than just paper. Consider plastics, IT devices, and other items used in high volume across the organization.

2 **Isolate high-impact opportunities to elevate environmental responsibility.**
Identify the natural and energy resources supporting the management of information assets and assess how a reduction in consumption or the introduction of eco-friendly alternatives could impact near- and long-term environmental, societal, and financial goals.

3 **Leverage collaboration within your organization and through extended partnerships to realize your vision.**
Empower your employees to be part of the solution through ongoing education, and strategically select partners with a like-minded commitment who offer both the resources and reach to amplify your program's impact.

4 **Expand the way you think about workflows and processes.**
Do not think about the supply chain solely as a linear process with a starting and an end point. Think about your processes as cycles to uncover often-overlooked opportunities to recycle, remarket, or reuse materials in new and exciting ways.

5 **Align sustainability programs to business priorities.**
In order to gain leadership's buy-in, build a business case that demonstrates the business value in addition to the positive social or environmental impact. This might include forecasted savings, process efficiencies, or improvement in patient and employee safety.

6 **Measure, Measure, Measure.**
Once the program is in place, regularly measure and report on your program's impact to create a level of visibility and excitement that will support long-term growth and adoption.

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Figure 2: Sources of carbon emissions by proportion of NHS Carbon Footprint Plus

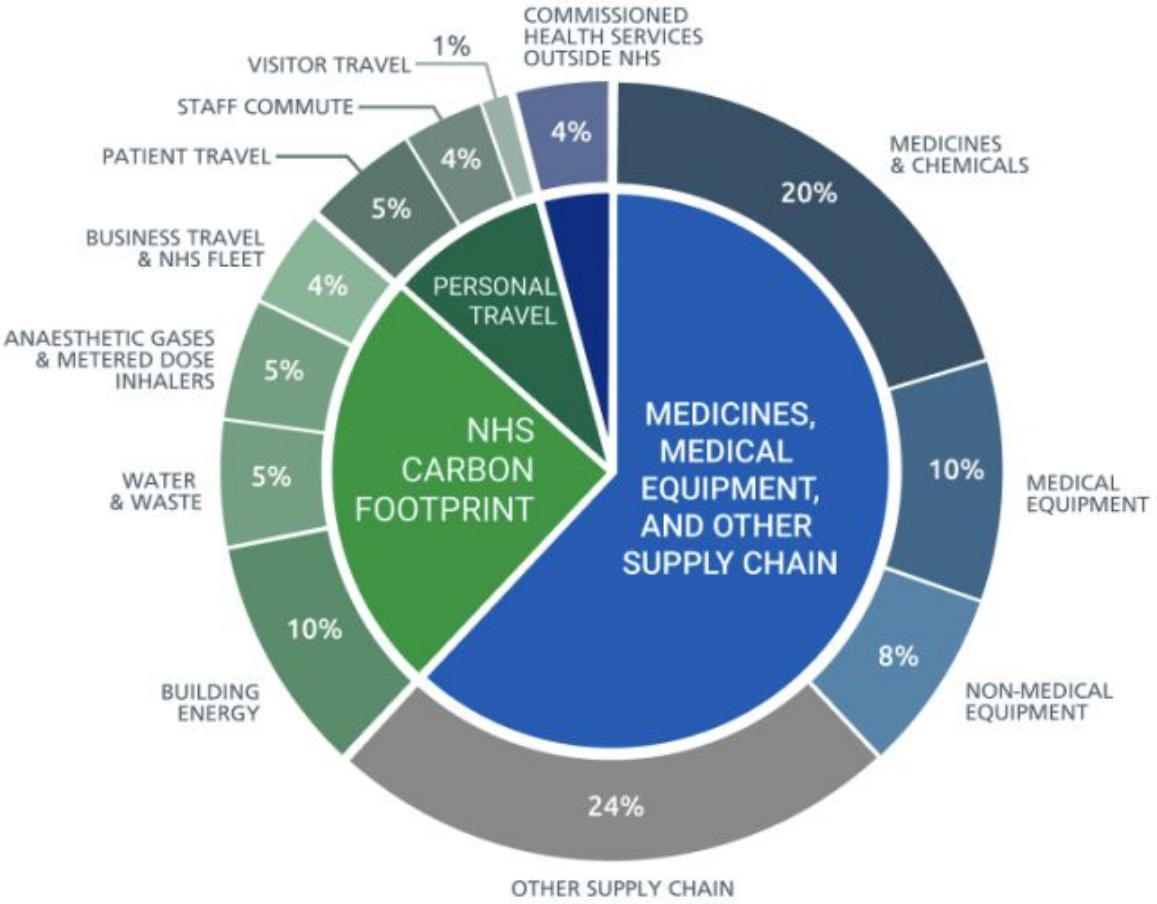
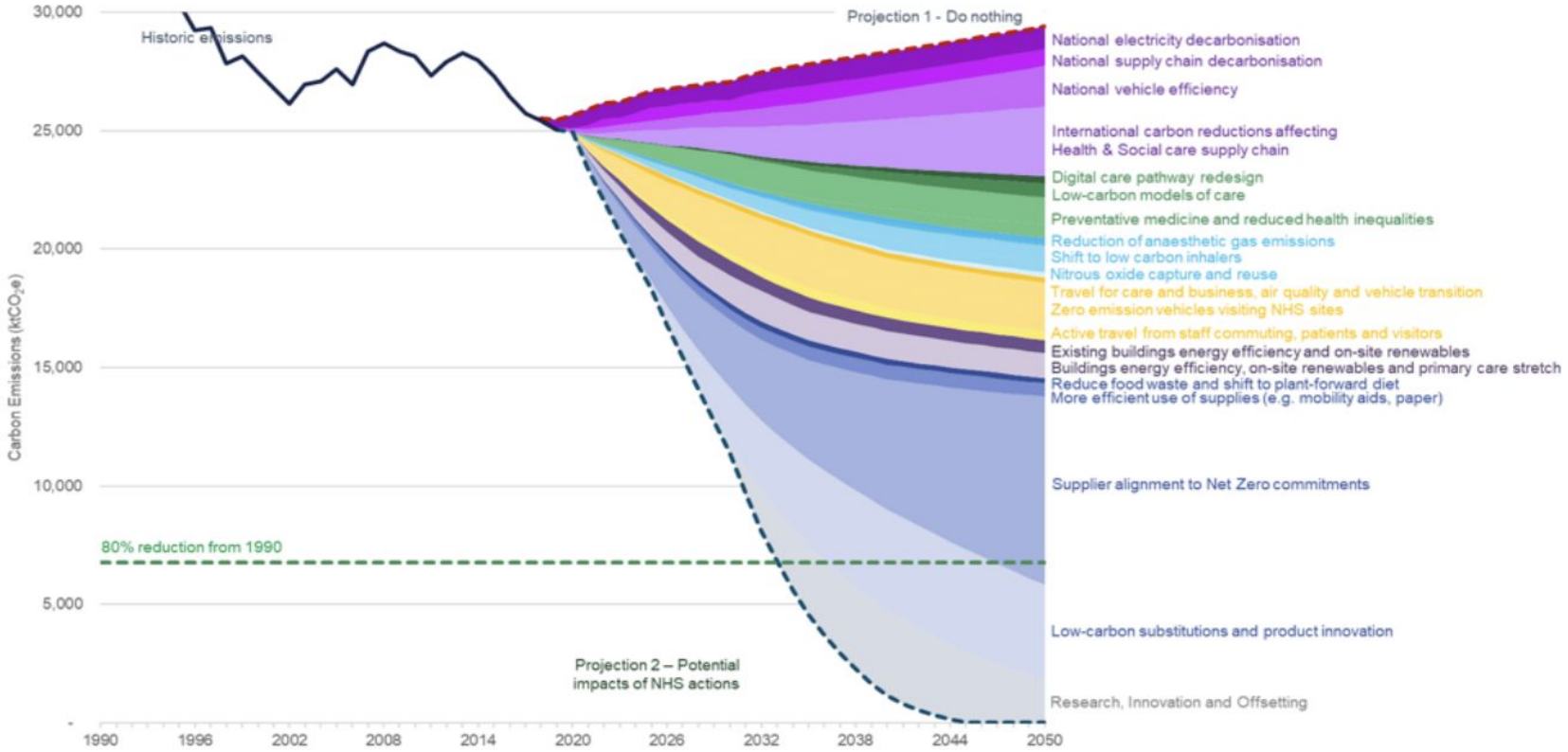


Figure 5: Pathway to net zero for the NHS Carbon Footprint Plus Scope



From health care to health

Determinants of health: inclusion, equality, environment, food, activity

Today’s health care is detrimental to inclusion, equality, environment

Rethink health within sustainable wellbeing for all

How to think of sustainability - key points

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